

Monetary Charity Distribution Using Blockchain

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Executive Summary

Pakistan distributes approximately \$10-\$20 in unconditional cash grants to 5.9M poor persons/families living in far-flung areas. Binance Charity on the other hand is running a similar operation in Africa. Getting massive amount of cash into massive amount of beneficiaries open doors to corruption. Blockchain and specifically Ethereum is poised to take advantage of the inefficiencies of the existing systems.

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Problem Statement

Pakistan is running the world's largest single social safety-net program, called BISP, this program distributed \$900M to 5.4M beneficiaries in 2016 [1]. The program is supported by major donor agencies of the world such as USAid and DFID. Similarly, in more modern examples, Binance Charity Foundation has collected \$3.3M to spend on 93,000 beneficiaries in Africa [2].

Both programs have two common problems:

1. Identifying and documenting those who are most in need of income support.
2. Sending cash to beneficiaries who mostly don't know how to read and write, let alone know of any digital means to access charity money.
3. The transaction value for each individual is low - often in tune of \$10-\$20 per person or family per month.

In traditional centralized systems, these issues create opportunities of corruption on a massive scale, I personally know in case of BISP, end-users often received less-than half of the cash that was sent for them.

Below I will try to explain what solutions were used by BISP since the start:

Current & Past Approaches to Solve the Problem

- Onboarding

BISP started in 2008, at the time there was no data available to support the mapping of those who should receive income-support in the means of cash, so parliamentarians were tasked to do a survey and fill out forms for families that were deemed as eligible for the cash grant. Later in 2009, a nation-wide survey was conducted using Proxy Means Test that enrolled beneficiaries to the program [3].

Problem with this approach: Last-mile onboarding is still done through persons who are either directly employed by the program or who work for the government in some capacity. As humans, these persons can be biased and can include factors such as religion, caste or personal likes and dislikes. Similarly, at least in the start, powerful influencers of an area filled forms on behalf of their poor employees and received cash grants directly by aligning themselves to people distributing the grants.

- Cash-disbursement

Initially, Pakistani government engaged Pakistan Post to distribute cash grants to women who are mostly living in far-flung areas that were only accessible to Pakistan

Post's foot-persons [4]. Later, on the reports of irregularities BISP ran several cash-disbursement experiments such as using mobile-money transfer services, debit-cards to be used at ATMs and lastly, a combination of Biometric and chip enabled National ID card that could be used to at specified agents to withdraw money. Note that a combination of all of these payment methods are still being used for cash-disbursement in different districts [5].

Problem with this approach: As BISP discusses on its own website [5], all of these methods are prone-to massive corruption. In the case of first approach, postman keeps cut of the disbursement or doesn't distribute them at all. I know this personally as one of my best friends was recruited as Pakistan Post Manager in one of the important districts for BISP (Mirpur Khas, Sindh). He told me not only postmen are to blame here, the corruption orders were coming from higher-ups who were demanding their cuts from the corrupt collections that were made by postmen distribution BISP cash.

When you come to other approaches such as using a debit card, problems like lost pins, lost or stolen cards and their replacement and most frequent of all is the problem of taking cash out of these cards as most ATMs are only available in city-centers. So, one beneficiary will either have to travel to the nearest city or give her card to someone else to take out cash. Even if she could make it to the ATM, she wouldn't know how to withdraw cash or operate ATM, so these services are again entrusted to the middle-men who again take their cut or commission from what little was dispersed to someone on the lowest level of income.

In a recent chat with a Binance executive, I discovered they are facing similar problems with their Binance Charity initiative - they send cash to someone who is living close to beneficiary areas and they will distribute this cash to the beneficiaries. I am not too familiar with this process but I assume there has to be some blockchain chain based identification process that could resolve the need of sending someone hard-cash to distribute it to someone else.

- Transaction Value and Cost

This is sort of a minor problem in BISP's scenario but since we are considering a disruption through blockchain, transaction costs to distribute to 5.9M people is a thing to think about. Currently, as BISP is paying through a Bank debit card, the transaction cost that a recipient bears is PKR 18 per transaction - view this in context of what she is receiving every month - that is PKR 2000.

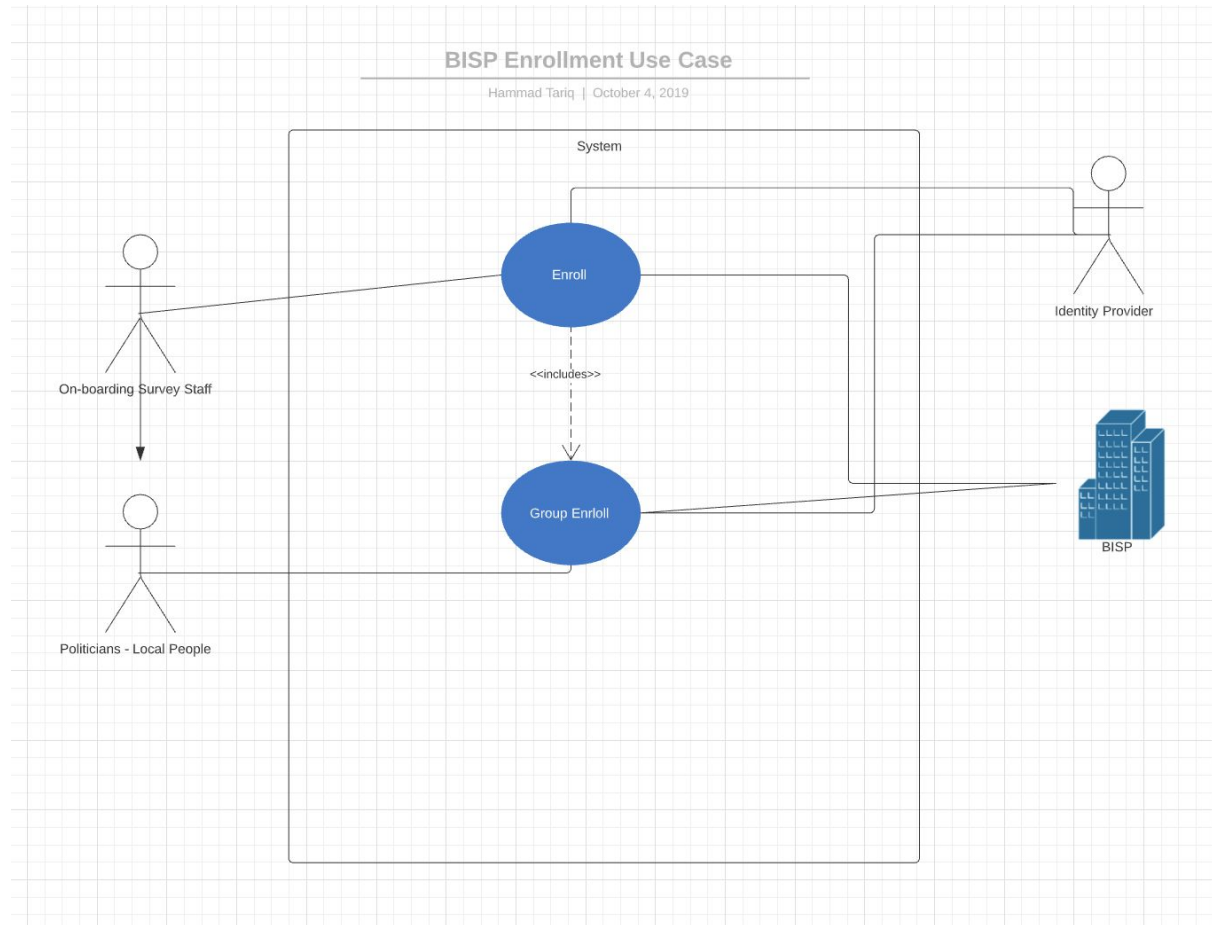
Use Case Description

Below are few use cases related to unconditional cash grant charity distribution in current paradigm:

Use Case 1 Description

Use Case 1	Basic Enrollment into Cash-grant Program
Actor	BISP Enrollment Clerk
Basic Flow	Enrollment clerk visits a village and using paper survey forms asks questions by going door-to-door. He then comes home, digitizes his records and submits to them BISP head-office software that uses Proxy Means Test and other scientific algorithms to rank people and signal out beneficiaries who are most in need.

Basic UML Diagram of Use Case 1

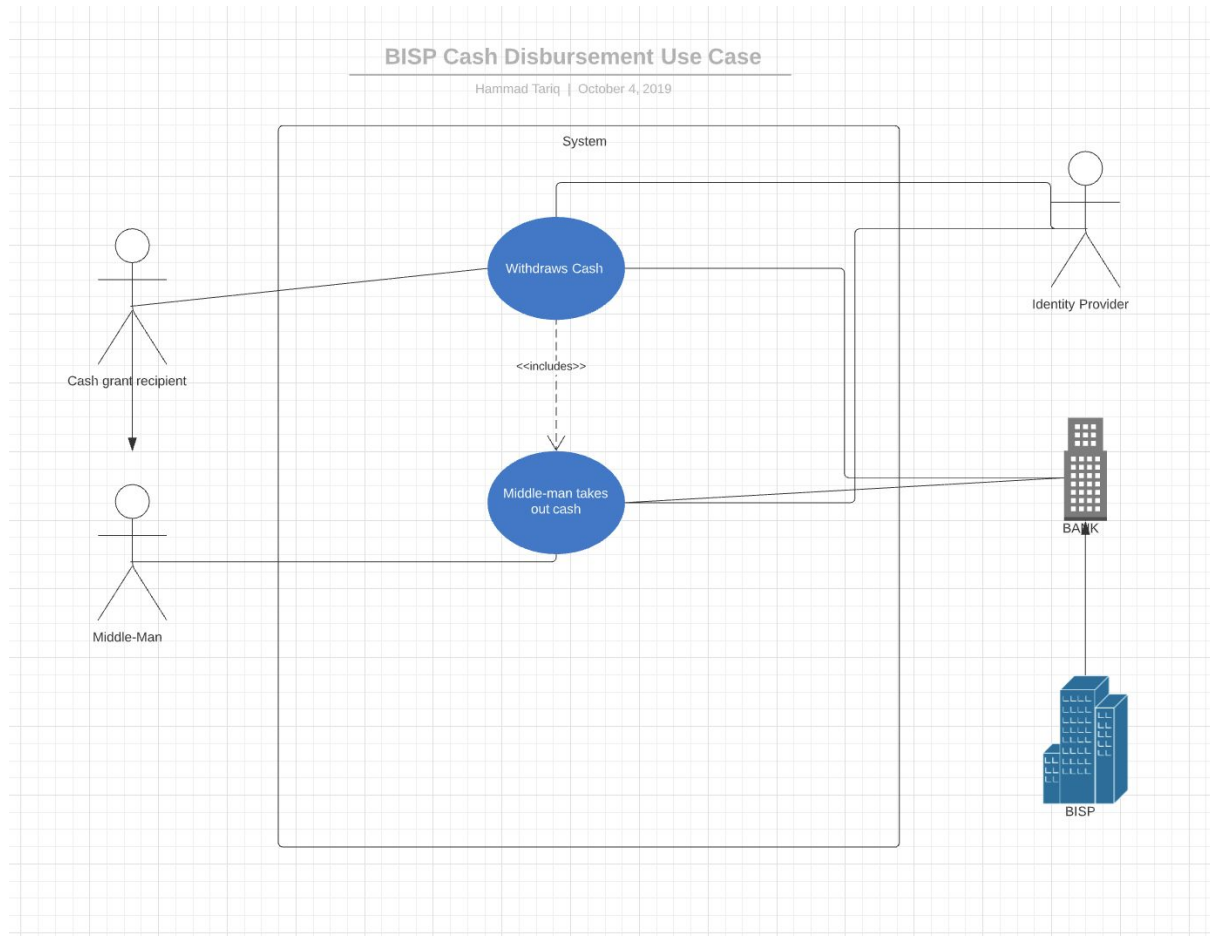


Use Case 2 Description

Use Case 2	Cash-disbursement through Bank Debit Card
Actor	Cash-grant beneficiary

Basic Flow	<p>A 60-year old widow takes a bus from her village to go to near-by town. She is holding a plastic debit card given by BISP program. Upon reaching an ATM, she doesn't know how to approach it. She asks a middle-man or bank manager to help her. Middle-man take a 20% cut and hands out the rest of her monthly grant.</p>
Alternative Flow 1	<p>Middle-man runs away with her card!</p>
Alternative Flow 2	<p>Middle-man tells her she hasn't received any of her grant and pockets all her money!</p>
Alternative Flow 3	<p>Middle-man is honest and just helps the woman.</p>

Basic UML Diagram of Use Case 2

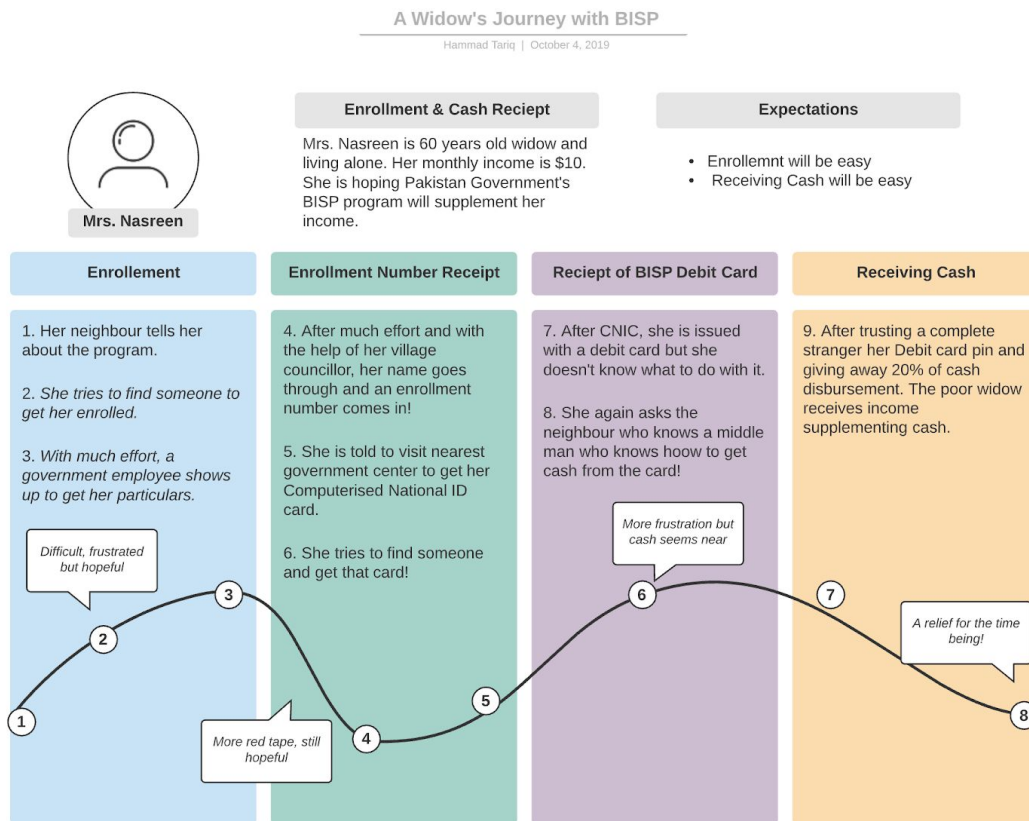


BISP Stakeholder Map

An artifact showing power and interest analysis of BISP stake-holders:



Journey Map: A Widow's Journey as a BISP Cash Grant Recipient

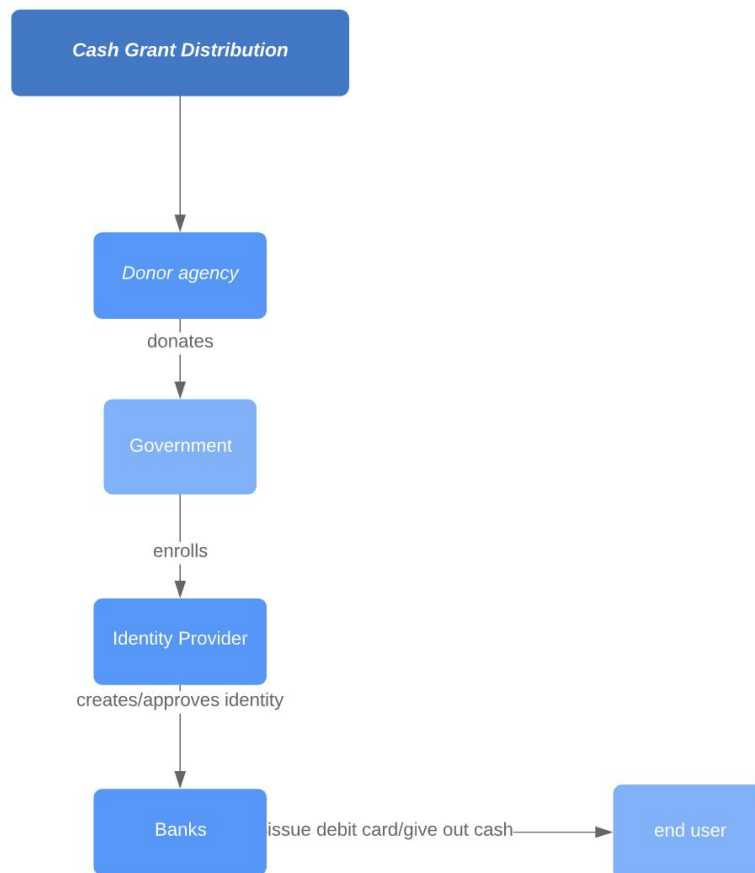


Basic Concept Map of BISP

Below is a very high level concept map of how BISP program works:

Basic Concept of BISP

Hammad Tariq | October 4, 2019



Proposed Solution

Potential for Blockchain to Disrupt Monetary Charity Distribution Worldwide

Below are my thoughts on how Blockchain/ethereum can be used to disrupt monetary charity distribution worldwide. However, it will need to be adopted by donor agencies such as USAid and DFID by themselves. It's heartening to see UNICEF already involved with blockchain [6] and last year USAid published a primer on Blockchain [7]. Getting these agencies onboard seems to have less friction than ever and public blockchains like Ethereum are well-suited to serve the purpose of transparent charity distribution world-wide. It can not only serve to make cash grant distribution possible but also can be programmed to handle complex use-cases such as DFID recently came under-fire for poor construction in schools that were funded by UK taxpayers money [8].

One of the solutions can be constructed by using the following parts a blockchain:

Identity Layer

A beneficiary identity can be established once over the blockchain - this can be done by using donor's own workforce or by gamifying the token distribution among local, a concept made popular by Google Maps where you get points to find those most in need and then those entries are verified by other members of the public. This beneficiary identity then can be tracked and linked by various donor agencies to know the lifecycle of charity benefit, improvement in lifestyle of the beneficiary and if the taxpayers money was used in appropriate places. Identity layer will include the elements to make onboarding/enrollment possible!

Grant Distribution

Although, taking cash out of debit card does not seem to have a high transaction cost but if you add up the factor of handling that cash downstream from government to banks and the cost of issuing the debit card is significant. Even if we want to stay with issuing a debit card for off-ramp, removing bank and government can save huge costs. Also, we can batch transaction and submit them at once to the mainnet (using a roll-up implementation that is Matter Labs is using [9]) for minimum transaction fee.

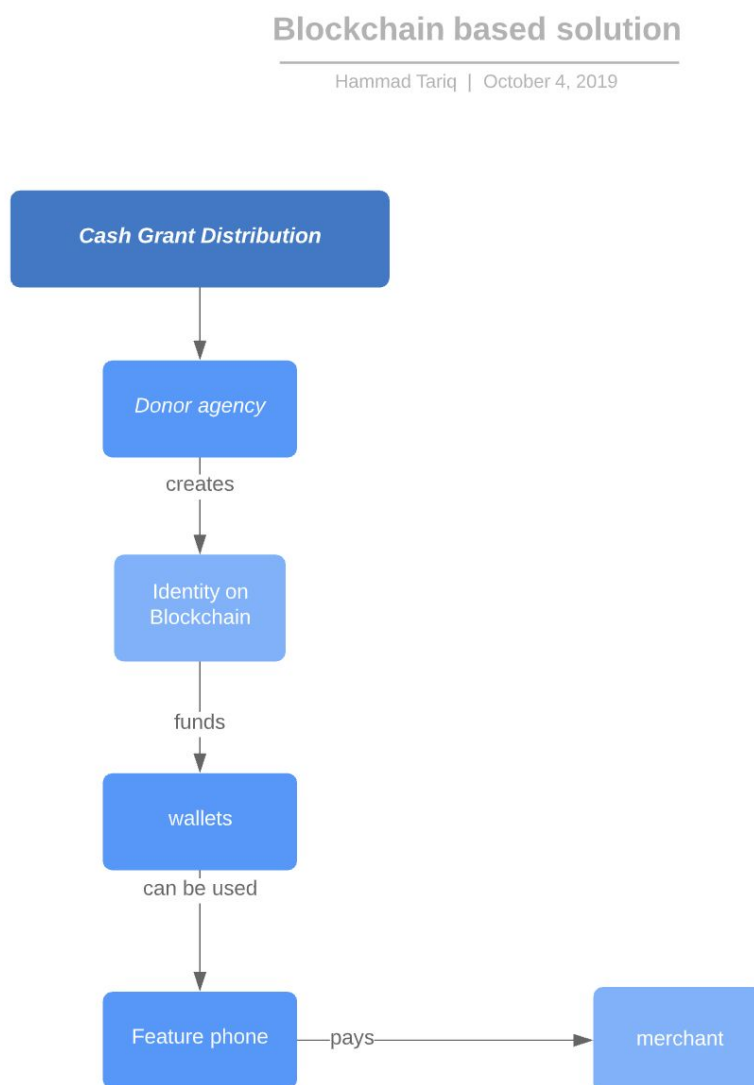
Creating Payment Ecosystems

One novel idea that comes to mind is using Althea - that creates a mesh network of nodes to provide internet access to the rural areas and combine that with the technology being used in India that allows customers to pay using their feature phones that emit sound at a specific

frequency that a receiving device can verify [10]. So, let's suppose we have a rural area that has one grocery shop that can afford to link up to the internet. Other shopkeepers can use Althea to connect using that shop's Internet and can also have low-cost feature phones that accept sound-based payments from other feature phones. Donor agencies can then distribute these low-cost phones, that cost about \$7-\$8 among cash grant beneficiaries. These beneficiaries can then use their phones to purchase groceries, clothes etc. locally using their cash grant.

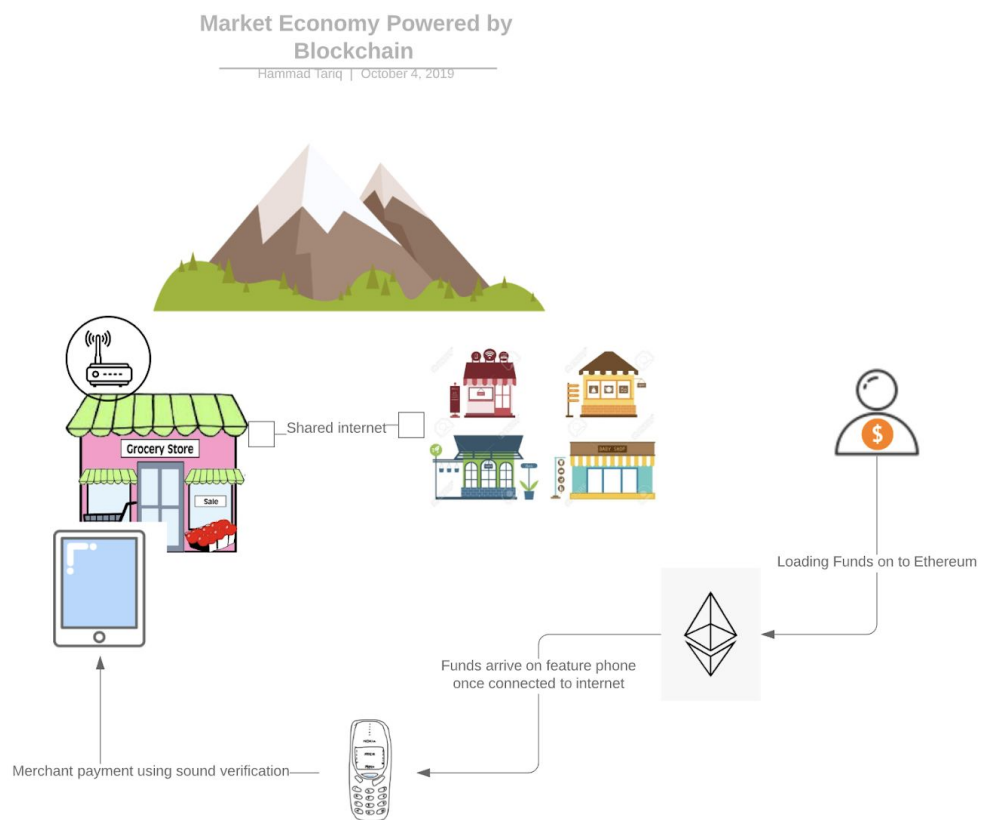
Basic Concept Map of the Solution

A basic concept map of such an ecosystem can be seen as below:



Graphical Representation of the Solution

A basic graphical representation of the proposed solution is shown in the below diagram:



References:

- [1] [Benazir Income Support Program](#)
- [2] [Binance Charity Foundation](#)
- [3] [BISP Cash Grant Objectives](#)
- [4] [Clarification: For BISP, Pakistan Post was the only delivery choice available](#)
- [5] [BISP Payment Distribution Mechanism](#)
- [6] [UNICEF on Blockchain](#)
- [7] [USAID Primer on Blockchain](#)
- [8] [Uproar over £107m UK aid for shoddy schools in Pakistan](#)
- [9] [Matter Labs](#)
- [10] [This Amazon-backed startup makes digital payment possible without Internet](#)